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Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

Claims 1-170 (Cancelled)

171. (**currently amended**) A system for facilitating telecommunication capability for ~~an infrastructure~~ electromagnetic propagation medium comprising:

a signal medium;

a systematic and distributed signal conditioner comprising transponders, the transponders at least including repeaters, coupler arrangements, and necessary carrier frequency converters and transponder output level controls, wherein the ~~infrastructure~~ signal medium uses the systematic and distributed signal conditioner for enabling utilization of the signal medium; and

transponder interfaces connected to a D/A and A/D physical layer (PHY).

172. (previously presented) The system according to claim 171, wherein said interfaces are connected with a cable modem communication platform PHY requiring transmission line characteristics.

173. (previously presented) The system according to claim 171, wherein said interfaces control the signal dynamic balance to preserve signal-to-noise ratio and large signal handling.

174. (previously presented) The system according to claim 171, wherein said interfaces are active, powered devices located at accessible physical points to facilitate the conditioning of the signal medium to acquire transmission line-based system characteristics.

175. (previously presented) The system according to claim 171, wherein said interfaces are active, powered devices inserted at physical points on distance paths to

facilitate the conditioning of the signal medium to perform as a transmission line-based system.

176. (previously presented) The system according to claim 171, wherein said interfaces are active devices accessed through analog interfaces comprised of a telecommunication PHY.

177. (previously presented) The system according to claim 171, wherein said signal conditioner comprises a quenched regenerative signal processing gain operating at a suitable intermediate frequency through bi-directional filtering and bi-directional frequency conversion to allow signal medium coupling with port isolation ranging from zero and up.

178. (previously presented) The system according to claim 171, wherein said signal conditioner comprises quenched regenerative signal processing gain at an intermediate frequency connected to the signal medium through separated ports, through frequency conversion, and through individual input and output amplifiers and filters, and is coupled to the medium with port isolation ranging from zero to a predetermined maximum value.

179. (previously presented) The system according to claim 171, wherein said signal conditioner comprises quenched signal processing gain through bi-directional filtering and bi-directional superheterodyne mixing for same frequency band shifted frequency band amplification.

180. (previously presented) The system according to claim 171, wherein said signal conditioner comprises comprises superregenerative amplification at an intermediate frequency and is connected to the medium through separated ports through frequency mixers and through individual input and output amplifiers for same frequency shifted frequency band amplification.

181. (previously presented) The system according to claim 171, wherein said signal

conditioner comprises frequency conversion amplification at an intermediate frequency through at least two frequency conversions and frequency filtering connected to the medium through separated ports.

182. (previously presented) The system according to claim 171, where facilitation of predictable connectivity and bandwidth is applicable to all types of power grids and power circuits including buried cables, air mounted overhead cables, outdoor power grids, home power grids and in-building power-grids.

183. (previously presented) The system according to claim 171, aimed to sustain information bandwidth.

184. (previously presented) The system according to claim 171, arranged to facilitate the use of other carrier frequencies.

185. (previously presented) The system according to claim 171, arranged to accommodate a plurality of modulation types.

186. (previously presented) The system according to claim 171, compatible with modulation types which include at least the modulation types used with QPSK, QAM, OFDM, CDMA and DSSS.

187. (previously presented) The system according to claim 171, compatible with a physical layer of a plurality of telecommunication standards including ITU-T J112, ITU-T J122, IEEE 802.3, IEEE 802.3x, IEEE 802.11 x, IEEE 802.16x.

188. (previously presented) The system according to claim 171, further comprising up and down frequency conversions between the system interfaces and the telecommunication standard platform PHY.

189. (previously presented) The system according to claim 171, that utilizes inherent

system attenuation to improve the system performance through a distributed presence of active and passive compensation in said apparatus.

190. (previously presented) The system according to claim 171, wherein said apparatus can utilize inherent system attenuation properties to aid stability and noise conditions with quenched regenerative signal processing gain repeaters as two port amplifiers.

191. (previously presented) The system according to claim 171 further comprising power lines as the system medium.

192. (previously presented) The according to claim 171, compatible with non-standard proprietary telecommunication platforms including PHY of PLC Power Line Communication platforms.

193. (previously presented) The system according to claim 171, further comprising distribution panels, fuse panels, distribution boxes, junctions, junction boxes, substations along the signal traveling paths as hosts and power sources for signal repeaters and coupler arrangements to facilitate the distributed conditioning of the grid into a transmission line similar infrastructure.

194. (previously presented) The system according to claim 171, further comprising conductors of any of ground buried cables, air mounted cables and bare wires in differential mode using at least two conductors as pair.

195. (previously presented) The system according to claim 171, further comprising transmission lines using a wire where the wave is trapped along the metal surface of the conductor by using transmission with short wavelength between said transponders.

196. (previously presented) The system according to claim 171, further comprising a voltage distribution street light and control grid and low voltage grid.

197. (previously presented) The system according to claim 171 further comprising active, powered devices in junction points in the power grid to facilitate the conditioning of the grid towards performing like a transmission line based system.

198. (previously presented) The system according to claim 171 further comprising inherent attenuation in junctions to form multi-ports with mutual isolation to aid stability and noise conditions with superregenerative as well as superheterodyne repeaters.

199. (previously presented) The system according to claim 171 comprising a coupler to spaced, unshielded wires, arranged as a magnetic loop antenna providing a galvanic insulated differential coupling to at least two conductors.

200. (previously presented) The system according to claim 171 further comprising a coupler to the termination of a shielded cable, arranged using the shield of the cable as a capacitive coupler, using a toroid ferrite clamp on the shield grounding wire and a ferrite toroid outside on the shielded cable at a short distance from the shield grounding wire, and where the two signal connection points are at opposite sides of said toroid ferrite clamp being equal to a coupling winding through the toroid.

201. (previously presented) The system according to claim 200 further comprising two said coupler arrangements on two cables to provide differential signal coupling.

202. (previously presented) The system according to claim 171 further comprising an existing capacitive voltage measurement probe for a shielded cable assembly for medium voltage system, for signal coupling.

203. (previously presented) The system according to claim 202 further comprising two said probes of at least two said shielded cables to provide differential signal coupling.

204. (previously presented) The system according to claim 203 further comprising a matching device to optimize signal coupling through the low capacitance of said probes.

205. (previously presented) The system according to claim 171 further comprising fibre coax HFC arrangements to obtain accessing of the system at shorter intervals and binding together the system.

206. (previously presented) The system according to claim 171 comprising other power lines than low voltage power lines to complement fibre access.

207. (previously presented) The system according to claim 171 configured to accept D/A and A/D PHY headend equipment to be installed at any point in the system.

208. (previously presented) The system according to claim 171, wherein said apparatus includes transponders for customer premises equipment.

209. (previously presented) The system according to claim 171, wherein said apparatus is arranged in distribution panels using transponders to link signals between a coupler on an incoming supply cable with couplers on outgoing cables to reduce effects from inherent losses, reflections and mismatches and to utilize inherent attenuation in the distribution system to provide isolation between in port and out ports and between out ports.

210. (previously presented) The system according to claim 171, wherein said apparatus includes substations linked together on power lines.

211. (previously presented) The system according to claim 171, wherein transformer stations are equipped to facilitate routing of signals between a high voltage side and a medium voltage side through couplers and at least one of transponders, repeaters, cables, coaxial cables, fibre optic cables.

212. (previously presented) The system according to claim 171, wherein substations are equipped to facilitate routing of signals between a medium voltage side and a low voltage side through couplers and at least one of transponders, repeaters, cables, coaxial cables, fibre optic cables.

213. (previously presented) The system according to claim 171, wherein said apparatus embodiment can facilitate routing of signals through a transformer station utilizing stray capacitance coupling between transformer sections.

214. (previously presented) The system according to claim 171, wherein said apparatus includes a wireless system node at any point in the system with an antenna and interfaced with a repeating transponder as a node of the system.

215. (previously presented) The system according to claim 214, wherein said node of the system is an output node.

216. (previously presented) The system according to claim 214, wherein said node of the system is an input node.

217. (previously presented) The system according to claim 171, for frequency shifting in any power line junction point to adapt to varying power cable characteristics.

218. (previously presented) The system according to claim 171, that enables physical penetration of cables in long cable runs to insert repeating transponders with couplers to compensate for signal losses.

219. (previously presented) The system according to claim 171, wherein said apparatus is arranged to improve immunity properties at various physical positions using active cancellation of common mode noise from any of near field sources and far field sources by using reference sampling antennas and reference sampling probes for the common mode energy which aids identifying, characterizing and canceling common

mode interference.

220. (previously presented) The system according to claim 171, wherein said apparatus is arranged to accept any suitable number of any of A/D and D/A cost saving headend equipment to be supplementarily installed in any locations in the system.

221. (previously presented) The system according to claim 171, wherein said apparatus is arranged to incorporate non-galvanic high frequency interfacing by using a pair of fibre optic connections to a pair of repeaters transponders advantageously optically powered and galvanically installed separately with mutual galvanic isolation on at least two conductors to provide a differential, interface to voltage power lines conductors.

222. (previously presented) The system according to claim 171, wherein said apparatus is arranged to incorporate voltage transitions through coaxial cables.

223. (previously presented) The system according to claim 171, wherein said apparatus incorporates repeater nodes that have built-in processing capability in the form of a processor.

224. (previously presented) The system according to claim 223, wherein said apparatus incorporates repeater nodes that interface with remotely interrogated sensors.

225. (previously presented) The system according to claim 171, wherein said apparatus includes a number of master units installed at different locations in the infrastructure.

226. (previously presented) The system according to claim 171 that is a two-way system utilizing separate repeater functions in separate frequency bands in order to achieve an infrastructure system for more than one signal transmission direction.